

**Amendments to the Specification:**

Please amend paragraphs [0003], [0007], [0018], [0019], [0027], [0032], [0033], [0034], [0036], [0039], [0040], [0041], [0042], [0043], [0044], [0047], [0048], and [0049], the abstract and the title as indicated below.

Please amend the title of the application on page 1 as indicated below:

~~VOICE INPUT TO SYSTEMS INTERFACE TO LEGACY SYSTEMS~~ to SPEECH  
RECOGNITION INTERFACE FOR VOICE ACTUATION OF LEGACY SYSTEMS

[0003] A typical telephone company, for example, can have a number of such back-end legacy systems that I&M technicians may need to access to perform job orders. These legacy systems can include, for example, a loop facility assignment control system, a loop maintenance operations system, a computer system for ~~main frame~~ mainframe operations, a mechanized loop testing system, a secure network element contract server, a mechanized time reporting system, and a work activity statistical sampling

[0007] In an embodiment of the present invention, a user logs a computer onto a systems interface which permits access to back-end legacy systems. The computer is running client software to access the systems interface. Preferably, the client software is application-specific software such as the "TechNet TECHNET client application." Preferably, the systems interface includes a first server with middleware for managing the protocol interface. Preferably, the systems interface includes a second server for

receiving requests and generating legacy transactions. Preferably, the systems interface responds to the log-on attempt by presenting an introductory home page, such as a "TechNet TECHNET home page." After the computer is logged-on, a request for voice input is made. Preferably, the request results from a technician selecting an icon or engaging a software button on the home page. In response to the request for voice input, a voice recognition module is launched or otherwise activated.

[0018] Systems interface 130 provides a systems interface between remote (and preferably portable, e.g., a ruggedized laptop computer) computers 100 seeking data from back-end legacy systems 140. Legacy systems 140 are generally mainframe-type computer systems that maintain data for a company. According to an embodiment, legacy systems 140 may include one or more of the following systems: a loop facility assignment control system; a loop maintenance operations system; a computer system for ~~main-frame~~ mainframe operations; a mechanized loop testing system; a secure network element contract server; a mechanized time reporting system; and a work activity statistical sampling plan.

[0019] The general operation of the system of FIG. 1 is as follows. A user of computer 100, such as a technician, logs onto systems interface 130 over communications network 120. The computer is running client software that includes a client graphical

user interface (GUI) to interface with systems interface 130. After the log-on, systems interface 130 permits computer 100 to submit requests for information from legacy systems 140. The user can submit the requests either by keyboard entry of inputs to the client GUI or by voice inputs to a ~~voice~~speech recognition module. After receiving the requests, systems interface 130 processes the requests, generates legacy transactions, receives information from legacy systems 140, and transmits the information back to computer 100.

[0027] Computer 200 is a remote and preferably portable computer used by a technician. Computer 200 may be any of the devices discussed above for computer 100 (FIG. 1). Additionally, computer 200 of FIG. 2 of the instant application may comprise the "TechNet TECHNET client PC" disclosed in the '815 application, including any associated hardware and/or software disclosed in connection therewith. Computer 200 may include a memory for storing certain software discussed below. The memory can be internal or external. The memory can include any means for storing software, including a hard disk, an optical disk, floppy disk, ROM (read only memory), RAM (random access memory), PROM (programmable ROM), EEPROM (extended erasable PROM), and so forth.

[0032] Computer 200 can run a client application for accessing the systems interface. Preferably, the computer is running the client application disclosed in the '815

application as the "~~TeehNet~~ TECHNET client application." The client application includes a client graphical user interface (GUI) layer that provides the user interface for receiving requests for information from the user, displaying information retrieved from the back-end systems, and other user interface tasks.

[0033] Upon log-on, a primary screen or primary home page may be presented to the user of computer 200 by the client GUI. Preferably, this primary home page is a "~~TeehNet~~ TECHNET home page" that presents various options for requesting information (referred to herein as "operations") from legacy systems. A technician may make the requests by keyboard entry of inputs to the client GUI. For example, the technician may select a particular operation (e.g., "Retrieve Client Account Information") using a mouse or like pointing device. The technician may then type in the information for a client (e.g., name, address, phone number, account number, and/or social security number, etc.) into client GUI-provided data fields. The client software formats the inputs into requests that are forwarded to the systems interface in order to retrieve the desired information. Other requests for information from the various legacy systems 270 can be initiated by typing in the appropriate information.

[0034] Alternatively, the user can opt to make the requests by voice input. After the computer is logged-on, the user makes a request for voice input. Preferably, the request for voice input is made by a technician speaking to the computer to start the

application. When the PC is turned on, a ~~voice~~ speech recognition application is launched or otherwise activated. The user inputs voice commands into audio input device 280 that are processed by the ~~voice~~ speech recognition application in order to select particular operations and to complete the data fields for those operations. The ~~voice~~ speech recognition application and the client software are integrated so that voice input selection of a particular operation results in that operation being selected by the client GUI. The two software applications are also integrated so that voice input of information (for the selected operation) is used to complete the data fields presented by the client GUI. As before, the client software formats the inputs into requests that are forwarded to the systems interface in order to retrieve the desired information.

[0036] In the embodiment of FIG. 3, computer 200 is programmed with ~~voice~~ speech recognition module 305, client application 310, and operating system 320.

[0039] Voice recognition module 305 is the ~~voice~~ speech recognition software application that runs on computer 200 in order permit the user to present voice input requests to voice input device 280 (FIG. 2). ~~Voice~~ Speech recognition module 305 is capable of performing STT (speech-to-text) operations that translate spoken words into text or other characters or commands. When activated, ~~voice~~ speech recognition

module 305 is capable of recognizing voice inputs for selecting operations and/or for inputting information to complete data fields.

[0040] For example, a home page displayed to a user by the client GUI may present options for several operations (e.g., "Get a Job," "Retrieve Client Account Information," and so forth). ~~Voice~~ Speech recognition module 305 is programmed to recognize verbal utterances of these operations, which are translated into a command that selects the corresponding operation in much the same way as if the user had selected the operation with a pointing device.

[0041] For example, after selecting a particular operation (e.g., "Retrieve Client Account Information"), the client GUI may present a page with data fields to be completed. ~~Voice~~ Speech recognition module 305 is programmed to translate verbal inputs into text that is used to complete these data fields.

[0042] According to one embodiment, ~~voice~~ speech recognition module 305 has a series of submodules or subcomponents tailored to the various pages that may be presented by the client GUI. For example, the client GUI may be adapted to present a home page presenting several operations, as well as a series of linked pages corresponding to each operation. ~~Voice~~ Speech recognition module 305 may tailor its voice recognition processing according to the active page presented by the client GUI. For

example, there may be a separate vocabulary accessed by ~~voice~~speech recognition module 305 for each of the pages.

[0043] Design and coding of ~~voice~~speech recognition module 305 is well within the skill of the ordinary artisan. Currently, a number of ~~voice~~speech recognition software applications are commercially available. Such a commercially available application could be programmed or modified or adapted to perform the specific speech recognition operations of the present invention.

[0044] Commercially available ~~voice~~speech recognition applications include those sold by United Research Labs (e.g., ~~VoiceAction~~ VOICEACTION), Dragon Systems (e.g., ~~NaturallySpeaking~~ NATURALLYSPEAKING and DRAGONDICTATE ~~DragonDictate~~), IBM (~~ViaVoice~~ VIAVOICE, Natural Language Understanding, voice-enabled forms technology see (~~www-4.ibm.com/software/speech/enterprise~~), ~~Lemour~~ Lernout & Hauspie ~~Houspie~~ (e.g., Voice Xpress), Phillips Speech Processing (e.g., ~~FreeSpeech98~~ FREESPEECH98), Verbex Voice Systems (e.g., Listen for Windows). Preferably, voice recognition module 305 is based on the Nuance 7.0 product sold by Nuance Communications of Menlo Park, California. The suite of Nuance products includes API interfaces for various programming languages to enable the development of voice-driven applications. ~~Information on the Nuance~~

~~products is available at the web site at www.nuance.com.~~ Alternatively, voice recognition module 305 can be coded as a custom application.

[0047] In step 410, a ~~voice~~ speech recognition application is launched or otherwise activated. For example, the voice recognition application can be launched as part of the computer start-up process. Alternatively, the ~~voice~~ speech recognition module 305 of FIG. 3 may be activated by a user when needed. If the ~~voice~~ speech recognition software is started at computer startup, the user is able to start the TechNet application as well as using ~~voice~~ speech recognition capabilities to input and receive data from TechNet application. For example, to get from one field to a next field, the user can say "TAB" to move the cursor to the next field. Similarly, to input data, the user can say "Enter" and then data will be entered. To go to a new screen or to move to a new page in the application, the user can say, for example, "Go To" and then state the page he wishes to go to. For example, the user can say "Cosmos Inquiry" to go to a page for searches.

[0048] In step 415, voice inputs are received. For example, ~~voice~~ speech recognition module 305 (FIG. 3) may receive voice inputs based on a technician speaking into voice input device 280 (FIG. 2).



[0049] In step 420, the voice inputs are converted to a request that can be processed by the systems interface. Step 420 may comprise ~~voice~~ speech recognition module 305 processing the voice inputs in order to correlate or interpret them in accordance with a client GUI. As discussed above for FIG. 3, a client GUI may present options for operations and/or data fields corresponding to an operation. According to step 420, ~~voice~~ speech recognition module 305 processes the voice inputs (e.g., by accessing a stored vocabulary) to select operations and to complete data fields. When all information necessary for a request has been received by the client application, the request is formatted so that it is ready for transmission to the systems interface.

Please amend the abstract as indicated below.

Methods and apparatus are disclosed for a technician to access a systems interface to back-end legacy systems by voice input commands to a ~~voice~~ speech recognition module. Generally, a user logs a computer into a systems interface which permits access to back-end legacy systems. ~~The computer is running client software to access the systems interface.~~ Preferably, the systems interface includes a first server with middleware for managing the protocol interface. Preferably, the systems interface includes a second server for receiving requests and generating legacy transactions. ~~Preferably, the systems interface responds to the log-on attempt by presenting an introductory home page.~~ After the computer is logged-on, a request for voice input is made. ~~Preferably, the request results from a technician selecting an icon or engaging a software button on the home page.~~ A ~~voice~~ speech recognition module is

Serial No.: 09/892,664  
Art Unit: 2654

Attorney's Docket No.: BS00-353  
Page 12

launched or otherwise activated. The user inputs voice commands that are processed to convert them to commands and text that can be recognized by the client software. The client software formats the requests and forwards them to the systems interface in order to retrieve the requested information.